

CLAIMS

What is claimed is:

1. A magnetic memory cell comprising:

a magnetic element, the magnetic element being written using a first write line and a

5 second write line, the magnetic element residing at an intersection between the first write

line and the second write line, the second write line oriented at an angle to the first write

line, at least a portion of the second write line being covered by an insulating layer, a

magnetic layer covering at least a portion of the insulating layer, the portion of the insulating

layer residing between the magnetic layer and the second write line, the magnetic layer

10 including a soft magnetic material.

2. A magnetic memory comprising:

a first plurality of write lines;

a second plurality of write lines oriented at an angle to the first plurality of write

15 lines, each of the second plurality of write lines having a top and at least one side;

an insulating layer covering at least a portion of each of the second plurality of write

lines; and

a magnetic layer covering a portion of the insulating layer, the portion of the
insulating layer residing between the magnetic layer and the second plurality of write lines,
20 the magnetic layer including a soft magnetic material;

a plurality of magnetic memory elements residing at intersections of the first

plurality of write lines and the second plurality of write lines.

3. The magnetic memory of claim 2 wherein the first plurality of write lines is a plurality of magnetic write lines.

5

4. The magnetic memory of claim 2 wherein the first plurality of write lines is electrically connected to the plurality of magnetic memory elements.

10 5. The magnetic memory of claim 2 wherein the first plurality of write lines reside below the plurality of magnetic memory elements, the first plurality of write lines being electrically connected to the plurality of magnetic memory elements; and
wherein the second plurality of write lines reside above the magnetic memory element, the second plurality of write lines being electrically isolated from the magnetic memory element.

15

6. The magnetic memory of claim 2 wherein the insulating layer is formed using a CVD or an ALCVD process.

20 7. The magnetic memory of claim 2 wherein the second plurality of write lines include aluminum and wherein the insulating layer is oxidized aluminum.

8. The magnetic memory of claim 2 wherein the insulating layer has a thickness of less than one hundred nanometers.

9. The magnetic memory of claim 2 wherein each of the second plurality of lines has a first thickness and wherein the soft magnetic layer has a second thickness of less than one half the first thickness.

10. A method for providing a magnetic memory comprising the steps of:
providing a first plurality of write lines;
providing a plurality of magnetic memory elements;
providing a second plurality of write lines oriented at an angle to the first plurality of write lines, the plurality of magnetic memory elements residing at intersections of the first plurality of write lines and the second plurality of write lines;
providing an insulating layer, a portion of the insulating layer covering at least a portion of the second plurality of write lines; and
providing a magnetic layer, the portion of the insulating layer residing between the magnetic layer and the second plurality of write lines, the magnetic layer including a soft magnetic material.

11. The method of claim 10 wherein the first plurality of write lines is a plurality of magnetic write lines.

12. The method of claim 10 wherein the first plurality of write lines are electrically connected to the plurality of magnetic memory elements.

13. The method of claim 10 wherein the step of providing the first plurality of
5 write lines includes providing the first plurality of write lines below the plurality of magnetic memory elements, the first write line being electrically connected with the plurality of magnetic memory elements; and

wherein the step of providing the second plurality of write lines includes providing
the second plurality of write lines above the plurality of magnetic memory elements, the
10 second write line being electrically isolated from the plurality of magnetic memory elements.

14. The method of claim 10 wherein the step of forming the insulating layer includes using a CVD or an ALCVD process.

15. The method of claim 10 wherein the second plurality of write lines include aluminum and wherein the step of providing the insulating layer further includes an aluminum oxidation step.

20 16. The method of claim 10 wherein the insulating layer has a thickness of less than one hundred nanometers.

17. The method of claim 10 wherein each of the second plurality of lines has a first thickness and wherein the step of providing the magnetic layer includes the step of providing a soft magnetic layer having a second thickness of less than one half the first thickness.